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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/727,802	Applicant(s) SCHWARZ ET AL.	
	Examiner Tung Vo	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03/13/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-44 and 47 is/are pending in the application.
- 4a) Of the above claim(s) 1-23, 45 and 46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-44 and 47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/13/2009 has been entered.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 24-32, 37, 39, and 41-44 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent and recent Federal Circuit decisions indicate that a statutory “process” under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example there is no device recited within the claims to accomplish an inventive step of the method.

4. Claims 34-36 are rejected under 35 USC 101 because the medium is not the memory of a computer and encompasses non statutory media such as a carrier wave or signal. Note claims recite a computer program stored on a network for transfer and enabling a computer or after having loaded into the memory of a computer, which indicates the medium is not a memory or a statutory medium.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 24-44, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Said (US 7,190,840) and in view of Yip (US 6,577,251).

Re claims 24, 33-38, and 47, Said further discloses a method for coding transform coefficients, the method being performed by a processor (e.g. a coder or decoder, figs. 1-5)

wherein for blocks of (video) pictures containing transform coefficients being unequal to zero (322 of fig. 3), a coding or decoding of transform coefficients takes place in such a way that, for each block,

a significance map (fig. 2, there is a significance map, 210 of fig. 2, significance maps, 212, 214, and 216 of fig. 2, are coded by compression, 112, and 114 of fig. 1) is coded, the significance map specifying the positions of transform coefficients being unequal to zero in the block in a scan order (e.g. 212, 214, and 216 of fig. 1, col. 3, lines 15-49, 314 of fig. 3, note ALL

COEFFICIENTS IN, ALL SCANS = 0, NO) in a context-dependent way using contexts depending on the corresponding scan position of the transform coefficient considered (fig. 3, the context-based coding assigns different codebooks to different distributions, scan position, 214, 212, 216 of fig. 2), and subsequently (326 of fig. 3),

in a reverse scan order (322 of fig. 3), starting with the last transform coefficient being unequal to zero within the block (PROCESS COEFFICIENTS IN SCAN is not equal to ZERO as determined in step 314 of fig. 3, ALL SCAN = 0, NO), the values of the transform coefficients being unequal to zero are coded (118 of fig. 1) in a context-dependent way.

It is noted that Said does not particularly disclose coding or decoding using contexts depending on a number of transform coefficients already coded in the reverse scan order having a magnitude of 1 and a number of transform coefficients already coded in the reverse scan order having a magnitude of greater than 1, respectively, as specified in claims 24, 33-38, and 47.

Note the specification of the present invention discloses [0036] it is also of advantage if the sign for each significant transform coefficient is indicated by a one-bit symbol (SIGN) and the magnitude is indicated by a binary coded symbol (ABS).

Yip teaches coding (fig. 1) and decoding (fig. 8) for coding and decoding the bit symbols of the coefficients in a predetermined order as re-arrange order using contexts depending on a number of transform coefficients already coded in the reverse scan order (note the reverse scan order is disclosed by Said, 322 of fig. 3) having a magnitude of 1 (e.g. one bit symbol of a coefficient is coded by the arithmetic coder, 102 of fig. 1, col. 1, lines 43-46; col.4, lines 57-61; which is the same as *a one-bit symbol (SIGN) of the disclosed present invention*) and a number of transform coefficients already coded in the reverse scan order having a magnitude of greater

than 1, respectively (the “significance” states of coefficients are coded by the arithmetic coder, a binary value of 00111, 102 of fig. 1, col. 1, lines 48-51; col. 4, lines 64-67, *the binary value of 00111 is the same as a binary coded symbol (ABS) of the disclosed present invention*).

Taking the teachings of Said and Yip as a whole, it would have been obvious to one of ordinary skill in the art to modify the process of Yip into the system of Said to reduce the hardware cost.

Re claims 25 and 29, Said further discloses wherein when coding the significance map, each transform coefficient being unequal to zero in the scan order is characterized (fig. 2) by a first one-bit symbol (SIG) serving to characterize transform coefficients being unequal to zero (e.g. one bit symbol of a coefficient is coded by the arithmetic coder, 102 of fig. 1, col. 1, lines 43-46; col.4, lines 57-61, Yip), i.e. each transform coefficient being unequal to zero including the last transform coefficient being unequal to zero in the scan order if it is different from the last transform coefficient of the block in the scan order, or excluding the last transform coefficient being unequal to zero in the scan order if it is the last transform coefficient of the block in the scan order, and the last transform coefficient being unequal to zero is characterized by a second one-bit symbol (LAST) indicating that the respective transform coefficient being unequal to zero is the last transform coefficient being unequal to zero in the scan order if it is different from the last transform coefficient of the block in the scan order (fig. 3; see fig. 2, e.g. second reverse scan order indicates a second one-bit symbol (LAST), Said; Note Yip further discloses a bit symbol for next coefficients, Fig. 5).

Re claim 26, Said further discloses wherein for each transform coefficient being unequal to zero, sign is indicated by a one-bit symbol (SIGN) (316 and 318 of fig. 3) and the magnitude

is indicated by a binary-coded symbol (ABS) (encoded or coded coefficients are binary code, 1 and 0).

Re claim 28, Said further discloses blocks containing transform coefficients being unequal to zero are characterized by a one-bit symbol (CBP4) in connection with further syntax elements, such as, for example, (CBP) or macro block mode (fig. 2).

Re claim 30, Said further discloses wherein modeling for the one-bit symbol (CBP4) (fig. 2, Macroblock), for coding the significance map (codebook, col. 3, lines 15-49) and/or for coding the coefficient magnitudes takes place in a context-dependent way (col. 2, lines 55-65).

Re claim 31, Said further discloses wherein no significance information (SIG, LAST) is transferred for the last scan position of a block (320 of fig. 1, Note code last non-zero coefficient).

Re claim 32, Said further wherein block types of transform coefficients having comparable statistics are summarized to block categories (All Scan = 0, 314 of fig. 3).

Re claim 42, 43, and 44, Creusere further teaches wherein coding the transform coefficients in the reverse scan order also comprises coding x-th bins with $x > 14$ of the magnitude of the transform coefficients using a non-adaptive context (col. 11, lines 23-37); wherein coding the significance mapping comprises coding the symbols SIG and LAST context-adaptively by use of context numbers indicated by the corresponding scan position of the transform coefficient considered, with the context numbers for SIG and LAST being different (col. 5, lines 35-36); wherein coding the significance mapping and coding the values of the transform coefficients is performed by arithmetical coding (fig. 10 (a)).

7. Claims 24-44, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yip (US 6,577,251) in view of Mitchell et al. (US 6,819,803).

Re claims 37, 38, and 47, Yip teaches a device (figs. 1 and 8) for decoding (fig. 8) a coding (fig. 1) of a significance map (figs. 4 and 5) and a subsequent coding of values of transform coefficients being unequal to zero for blocks of pictures containing transform coefficients being unequal to zero (fig. 5), the significance map specifying the positions of the transform coefficients being unequal to zero in an order (300 of fig. 3), and the coding of values of transform coefficients being unequal to zero comprising coded values of the transform coefficients being unequal to zero in a re-arrange order-starting with the last transform coefficient being unequal to zero (206 of fig. 2, note re-arrange the order of the 'significance' states output from the memory banks so that they go to the correct outputs of the multiplexers 206 of fig. 2), the device comprising:

means (802 of fig. 8, the decoding process is reverse coding process as disclosed in 102 of fig. 1) for decoding the significance mapping order in a context-dependent way using contexts depending on the corresponding re-arrange position of the transform coefficient considered (e.g. 206 of fig. 2, figs. 4 and 5); and

means (802 of fig. 8) for decoding the coded values of transform coefficients being unequal to zero in the re-arrange order (e.g. figs. 4 and 5, 206 of fig. 2) in a context-dependent way using contexts depending on a number of transform coefficients already decoded in the re-arrange order having a magnitude of 1 (the "significance" states of coefficients are coded by the arithmetic coder, a binary value of 00111, 102 of fig. 1, col. 1, lines 48-51; col. 4, lines 64-67, *the binary value of 00111 is the same as a binary coded symbol (ABS) of the disclosed present*

invention) and a number of transform coefficients already decoded in the re-arrange order having a magnitude of greater than 1, respectively ((the “significance” states of coefficients are coded by the arithmetic coder, a binary value of 00111, 102 of fig. 1, col. 1, lines 48-51; col. 4, lines 64-67, *the binary value of 00111 is the same as a binary coded symbol (ABS) of the disclosed present invention*)).

It is noted that Yip does not particularly teach a reverse scan order as claimed.

Mitchell teaches a reverse scan order (fig. 15) is applied to the encoding and decoding process.

Taking the teachings of Yip and Mitchell as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Mitchell into the decoding a coding transform coefficient based on the predetermined order of Yip to provide for reduced numbers of memory and much reduced processing while synchronization is maintained.

8. Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Said (US 7,190,840) and in view of Yip (US 6,577,251) as applied to claims 24 and 33, and further in view of Karczewicz et al. (US 6,856,701).

Re claims 39-41, the combination of Said and Yip does not particularly disclose binarizing a magnitude of a each transform coefficient into a sequence of bins, determining a context for the first bin of the magnitude of each transform coefficient based on a number of transform coefficients already coded in the reverse scan order having a magnitude of 1, context-adaptively coding the first bins of the transform coefficients using the determined contexts.

However, Karczewicz teaches binarizing a magnitude of a each transform coefficient into a sequence of bins, determining a context for the first bin of the magnitude of each transform coefficient based on a number of transform coefficients already coded in the reverse scan order having a magnitude of 1, context-adaptively coding the first bins of the transform coefficients using the determined contexts (fig. 7b, Bin to level is mapped, context).

Taking the teachings of Said, Yip, and Karczewicz as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Karczewicz in to the combined process of Said and Yip in order to provide the possibility of improved data compression to increase coding efficiency.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung Vo whose telephone number is 571-272-7340. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tung Vo/
Primary Examiner, Art Unit 2621